

CLAIMS

What is claimed is:

1. A method for analyzing an intracardiac electrocardiogram in an implantable cardiac device, the method comprising:
acquiring a plurality of intracardiac electrocardiogram signals;
ensemble averaging the plurality of intracardiac electrocardiogram signals to produce an ensemble average;
repeating the acquiring and ensemble averaging one or more times to produce a plurality of ensemble averages; and
processing the plurality of ensemble averages to generate a model of cardiac activity.
2. The method of claim 1, wherein processing comprises detecting an event within each ensemble average using one of a time and a level.
3. The method of claim 1, wherein acquiring comprises acquiring a continuous intracardiac signal and splitting the continuous intracardiac signal into the plurality of intracardiac electrocardiogram signals.
4. The method of claim 1, wherein processing comprises generating a histogram based on information from the plurality of ensemble averages.
5. The method of claim 4, wherein the histogram represents counts versus time.

6. The method of claim 4, wherein the histogram represents counts versus amplitude.
7. The method of claim 2, wherein the event is an evoked response.
8. The method of claim 2, wherein the event is an atrial event.
9. The method of claim 2, wherein the event is a ventricular event.
10. The method of claim 4, wherein the histogram represents occurrence of ventricular and/or atrial events with respect to time.
11. The method of claim 4, wherein the histogram represents occurrence of ventricular and/or atrial events with respect to amplitude.
12. The method of claim 1, wherein the repeating occurs for at least approximately 5 times.
13. The method of claim 1, wherein the repeating occurs from approximately 10 to approximately 100 times.
14. The method of claim 4, further comprising using the histogram to alter cardiac therapy.
15. The method of claim 4, further comprising analyzing the histogram to characterize cardiac function as normal or abnormal.
16. The method of claim 1, further comprising comparing an intracardiac electrocardiogram to the ensemble average.

17. The method of claim 4, further comprising analyzing an intracardiac electrocardiogram using the histogram.

18. An implantable cardiac device comprising:
means for acquiring intracardiac electrograms corresponding to a plurality of events;
means for generating an ensemble average for each of the plurality of sets of intracardiac electrograms; and
means for processing the plurality of ensemble averages to generate a model of cardiac activity.

19. The device of claim 18, further comprising means for comparing an ensemble average to information contained in an intracardiac electrocardiogram.

20. The device of claim 18, further comprising means for analyzing an intracardiac electrocardiogram using the histogram.

21. An implantable cardiac device for analyzing an intracardiac electrocardiogram in an implantable pacing device, the device comprising:
a lead system operative to acquire an intracardiac electrocardiogram signal;
a processor connected to the lead system and operative to ensemble average a plurality of cardiac events within the intracardiac electrocardiogram signal, wherein the processor is operative to use the ensemble average to classify subsequent events acquired by the lead system.